

10/510017

DT04 Rec'd PCT/PTO 0 1 OCT 2004

In the Claims:

The following listing of claims will replace any/all prior versions, and listings, of claims in the application:

1. (Currently Amended) Infrared (IR) measuring device, for essentially simultaneous, qualitative and quantitative determination of components in nonaqueous and aqueous systems, comprising:

at least one measuring unit, ~~comprising~~ having at least one ATR body and at least one infrared light source, ~~characterized by the fact that wherein the measuring unit contains at least one~~ ATR body (2), ~~which~~ has at least two plane, essentially parallel boundary surfaces (~~5a, 5b~~), ~~which and~~ is transparent or partially transparent to the measuring radiation and ~~which~~ has a refractive index which is higher than that of the medium to be investigated adjacent to at least one boundary surface, ~~especially it is higher than or equal to 1.5~~, where the IR measuring radiation is middle infrared radiation (MIR) and can undergo attenuated total reflection at least six times on at least one of the plane, parallel boundary surfaces (~~5a~~) of the ATR body (2).

2. (Currently Amended) Infrared measuring device according to Claim 1, ~~characterized by including~~ at least one, ~~especially~~ computer-aided evaluation units (~~7, 7'~~), unit and/or at least one detector (~~6, 6'~~).

3. (Currently Amended) Infrared measuring device according to Claim 2, ~~characterized by the fact that~~ wherein the evaluation unit (~~7, 7'~~) can be replaced by a second or further evaluation units (~~7, 7'~~).

4. (Currently Amended) Infrared measuring device according to ~~one of the previous Claims~~, ~~characterized by the fact that~~ Claim 1, wherein the infrared light source ~~represents~~ includes one or several quantum cascade lasers (~~4, 4'~~) or a radiation source (4a) emitting a continuous or emitting a multiwavelength spectrum, where the radiation of ~~this the~~ radiation source (4a) interacts with a sample system that can be included in or on the measuring unit and where the interferogram recorded by the detector (6) can be evaluated in the evaluation unit (7) using a Fourier transformation.

5. (Currently Amended) Infrared measuring device according to ~~one of the previous Claims~~, ~~characterized by the fact that~~ Claim 1, wherein the plane, essentially parallel boundary surfaces (~~5a, 5b~~) are essentially not metal-coated.

6. (Currently Amended) Infrared measuring device according to ~~one of the previous Claims~~, ~~characterized by the fact that~~ Claim 4, wherein the one or several quantum cascade lasers(s) (~~4, 4'~~) can emit electromagnetic radiation of at least one defined frequency, especially with predetermined, defined intensity, or at least of a defined frequency band, especially with predetermined, defined intensity.

7. (Currently Amended) Infrared measuring device according to ~~one of the previous Claims,~~ characterized by the fact that Claim 4, wherein two or more of the quantum cascade lasers(s) (4,4') can emit electromagnetic radiation of different frequencies, especially each with predetermined, defined intensity, and/or of different frequency bands, especially in the middle infrared region, and/or especially each with predetermined, defined intensity.

8. (Currently Amended) Infrared measuring device according to Claim 7, ~~characterized by the fact that~~ wherein the at least two quantum cascade lasers(s) (4,4') can simultaneously or almost simultaneously emit electromagnetic radiation of different frequencies, especially each with predetermined, defined intensity, and/or of different frequency bands, especially in the middle infrared region, and/or especially each with predetermined, defined intensity, ~~simultaneously or almost simultaneously~~.

9. (Currently Amended) Infrared measuring device according to ~~one of the previous Claims,~~ characterized by the fact that Claim 1, including one or several quantum cascade lasers(s) (4,4') that can emit electromagnetic radiation of different frequencies, especially each with predetermined, defined intensity, and/or of different frequency bands, especially in the middle infrared region, and/or especially each with predetermined, defined intensity, in a time sequence.

10. (Currently Amended) Infrared measuring device according to ~~one of the previous Claims,~~ characterized by the fact that a Claim 1, further including at least one quantum cascade laser (4,4') that can emit electromagnetic radiation in the form of pulses with defined duration, especially each with predetermined, defined intensity.

11. (Currently Amended) Infrared measuring device according to Claim 10, ~~characterized by the fact that~~ wherein the duration of the pulses, especially in the case of electromagnetic radiation with different frequencies or frequency bands, has a different length and/or the intensity of the pulses is of different magnitude.

12. (Currently Amended) Infrared measuring device according to Claim 10 ~~or 11,~~ characterized by the fact that wherein different frequencies or frequency bands of electromagnetic radiation originating from the at least one ~~or several~~ quantum cascade lasers (4,4') can be emitted sequentially or in any arbitrary sequence.

13. (Currently Amended) Infrared measuring device according to Claim 12, ~~characterized by the fact that~~ wherein the electromagnetic measuring radiation and/or its intensity can be detected according to a multiplex pattern, especially in a wavelength-specifically controllable, pulsewise emittable manner, and/or according to a multiplex pattern, especially corresponding to the multiplex pattern of the pulsed measuring radiation.

14. (Currently Amended) Infrared measuring device according to ~~one of the previous Claims,~~ characterized by the fact that the Claim 1, including a measuring cell (1) is comprising an especially pressure-resistant, flow-through cell or an especially pressure-resistant flow-through cell, which can be reversibly closed in the inlet and outlet region, or wherein the measuring cell (1) or the ATR body (2) is an especially pressure-resistant immersion probe.

15. (Currently Amended) Infrared measuring device according to ~~one of the previous Claims,~~ characterized by the fact that Claim 1, wherein the ATR body (2) represents at least one wall of a measuring cell or a part thereof or represents the measuring cell (1).

16. (Currently Amended) Infrared measuring device according to ~~one of the previous Claims,~~ characterized by the fact that Claim 1, wherein the ATR body (2) is made of a material selected from the group consisting of diamond, sapphire, cadmium telluride, thallium bromide/iodide, silicon, germanium, zinc selenide, zinc sulfide, magnesium difluoride, cesium iodide, silver chloride, calcium difluoride, potassium bromide, sodium chloride, and/or a material transparent to infrared radiation, especially a polymeric material with a refractive index of preferably  $\geq$  greater than or equal to 1.5, especially and polyethylene.

17. (Currently Amended) Infrared measuring device according to ~~one of Claims 2 to 16,~~ characterized by the fact that, with the aid of the Claim 1, further including an evaluation unit (7, 7'), that implements one or more factorial analyses, multiple least square algorithms or ~~neural neural~~ network analyses ~~can be carried out~~ based on the signals entering the detector (6, 6'), for the purpose of their evaluation.

18. (Currently Amended) Infrared measuring device according to ~~one of the previous Claims,~~ characterized by the fact that Claim 1, wherein at least the ATR body (2) ~~and/or the measuring unit (1)~~ can be or is thermostated.

19. (Currently Amended) Infrared measuring device according to ~~one of the previous Claims,~~ characterized by the fact that Claim 1, wherein the measuring unit (1) is pressure-resistant, especially to pressures up to 100 bar.

20. (Currently Amended) Infrared measuring device according to ~~one of the previous Claims,~~ characterized by the fact that Claim 1, wherein the ATR body (2, 12) can be placed at least on one boundary surface (5), which can be exposed to ~~the a~~ medium to be analyzed, and includes a coating (14), which is transparent to the measuring radiation, especially to ~~the an~~ evanescent field of the measuring radiation.

21. (Currently Amended) Infrared measuring device according to Claim 20, ~~characterized by the fact that~~ wherein the coating (14) has a thickness which is smaller than, preferably half of the wavelength of the infrared measuring radiation used, and it is especially in the range from about 2 nm to about 25  $\mu\text{m}$ , ~~preferably from about 2  $\mu\text{m}$  to about 10  $\mu\text{m}$ .~~

22. (Currently Amended) Infrared measuring device according to Claim 20, ~~characterized by the fact that~~ wherein the coating (14) has a thickness in the range of one-fourth of the wavelength of the measuring radiation used.

23. (Currently Amended) Infrared measuring device according to Claims 20 ~~to 22~~, ~~characterized by the fact that~~ wherein the coating (14) has an ATR body material layer, especially a diamond layer, and that the coated ATR body comprises ~~preferably~~ zinc selenide and/or zinc sulfide.

24. (Currently Amended) Infrared measuring device according to ~~one of~~ Claims 2 ~~to 23~~, ~~characterized by the fact that~~ wherein the detector (6, 6') includes a photoacoustic detector.

25. (Currently Amended) ~~Application of the infrared~~ A method of performing a chemical analysis, the method comprising using the measuring device according to ~~one of~~ Claims 1 ~~to 24~~, ~~for the determination to determine~~, especially essentially simultaneous, qualitatively and/or quantitatively the presence of one or more ~~determination of~~ components, especially selected from the group consisting of saccharides, urea, creatinine, triglycerides, carbon dioxide, protein, alcohols and/or phosphoric acid esters, in nonaqueous ~~and especially in~~ or aqueous systems.

26. (Currently Amended) ~~Application according to~~ The method of Claim 25, where especially one of beer, wine, fruit juice, spirits or soft drinks ~~are~~ is used as an aqueous system.

27. (Currently Amended) ~~Application according to~~ The method of Claim 25, where one of urine and/or feces is used as an aqueous system.

28. (Currently Amended) ~~Application according to~~ The method of Claim 25, where one of lymph, saliva and/or blood is used as an aqueous system.

29. (Currently Amended) ~~Application according to~~ The method of Claim 25, where the washing fluid obtained during dialysis is used as an aqueous system.

30. (Currently Amended) ~~Application according to~~ The method of Claim 25, where process fluid, waste water or washing liquor is used as ~~the~~ an aqueous system.

31. (Currently Amended) ~~Application~~ A method of using the infrared measuring device according to Claims 1 ~~to 24~~ Claim 1, including using the infrared measuring device for the qualitative and/or quantitative determination of components in fruits and vegetables.

32. (Currently Amended) ~~Application~~ A method of using the infrared measuring device according to Claims 1 ~~to 24~~ Claim 1, including using the infrared measuring device for the qualitative and/or quantitative determination of components in milk and dairy products.

33. (Currently Amended) Urinal, or a urinal pan, ~~containing~~ comprising: at least one ATR body, with at least two plane, especially essentially parallel boundary surfaces, which is transparent to middle infrared radiation (MIR), and has a refractive index which is higher than that of a medium to be investigated, which is adjacent to at least one boundary surface, ~~especially it is higher than or equal to 1.5~~, into which a laser beam, ~~especially at least a beam of a quantum cascade laser can be coupled~~; and/or at least one discharge line, into which a measuring unit, ~~especially a measuring cell~~, containing at least one ATR body with at least two plane, especially essentially parallel boundary surfaces, which is transparent or partially transparent to the measuring radiation, and has a refractive index, which is higher than that of the medium to be investigated adjacent to at least one boundary surface, ~~especially higher than or equal to 1.5 is placed~~, into which a laser beam, ~~especially at least one beam of a quantum cascade laser can be coupled~~.

34. (Currently Amended) Urinal according to Claim 34 33, especially including an infrared measuring device ~~according to one of Claims 1 to 24~~, characterized by the fact that having at least one measuring unit having at least one ATR body and at least one infrared light source, wherein the measuring unit contains at least one ATR body, which has at least two plane, essentially parallel boundary surfaces, which are transparent or partially transparent to the measuring radiation and which have a refractive index which is higher than that of the medium to be investigated adjacent to at least one boundary surface, where the IR measuring radiation is middle infrared radiation (MIR) and can undergo attenuated total reflection at least six times on at least one of the plane, parallel boundary surfaces of the ATR body, wherein the ATR body is in working connection with at least one quantum cascade laser and/or a detector and/or an evaluation unit.

35. (Currently Amended) Toilet, including a toilet bowl, ~~containing~~ comprising: at least one ATR body with at least two plane, especially essentially parallel boundary surfaces, which is transparent to middle infrared radiation (MIR), and which has a refractive index, which is higher than that of a medium to be investigated, which is adjacent to at least one boundary surface, ~~especially higher than or equal to 1.5~~, into which a laser beam, ~~especially at least one beam of a quantum cascade laser can be coupled~~; and/or at least a drainpipe, into which a measuring unit, especially a measuring cell, containing at least one ATR body with at least two plane, especially essentially parallel boundary surfaces, which is transparent or partially transparent to the measuring radiation and has a refractive index which is higher than that of a medium to be investigated, which is adjacent to at least one boundary surface, ~~especially higher than or equal to 1.5~~, is placed, into which a laser beam, ~~especially at least one beam of a quantum cascade laser can be coupled~~.

36. (Currently Amended) Toilet according to Claim 35, ~~especially comprising~~ an infrared measuring device ~~according to one of Claims 1 to 24, characterized by the fact that having~~ at least one measuring unit having at least one ATR body and at least one infrared light source, wherein the measuring unit contains at least one ATR body, which has at least two plane, essentially parallel boundary surfaces, which are transparent or partially transparent to the measuring radiation and which have a refractive index which is higher than that of the medium to be investigated adjacent to at least one boundary surface, where the IR measuring radiation is middle infrared radiation (MIR) and can undergo attenuated total reflection at least six times on at least one of the plane, parallel boundary surfaces of the ATR body, wherein the ATR body is in working connection with at least one quantum cascade laser and/or a detector and/or an evaluation unit.

37. (Currently Amended) Urinal, including a urinal pan, ~~containing comprising:~~ at least one ATR body with at least two plane, especially essentially parallel boundary surfaces, which is transparent to middle infrared radiation (MIR), and which has a refractive index, which is higher than that of a medium to be investigated, which is adjacent to at least one boundary surface, ~~especially higher than or equal to 1.5, into which a light beam, having a continuous spectrum or a multiwavelength spectrum, especially in the middle infrared region, can be coupled; and/or at least a drain pipe, into which a measuring unit, especially measuring cell, containing at least one ATR body with at least two plane, especially essentially parallel boundary surfaces, which is transparent or partially transparent to the measuring radiation and has a refractive index which is higher than that of a medium to be investigated which is adjacent to at least one boundary surface, especially higher than or equal to 1.5, is placed, into which a light beam, having a continuous spectrum or a multiwavelength spectrum, especially in the middle infrared region, can be coupled.~~

38. (Currently Amended) Urinal according to Claim 37, ~~especially including~~ an infrared measuring device ~~according to one of Claims 1 to 24, characterized by the fact that having~~ at least one measuring unit having at least one ATR body and at least one infrared light source, wherein the measuring unit contains at least one ATR body, which has at least two plane, essentially parallel boundary surfaces, which are transparent or partially transparent to the measuring radiation and which have a refractive index which is higher than that of the medium to be investigated adjacent to at least one boundary surface, where the IR measuring radiation is middle infrared radiation (MIR) and can undergo attenuated total reflection at least six times on at least one of the plane, parallel boundary surfaces of the ATR body, wherein the ATR body is in working connection with at least one light source, which emits a continuous spectrum or a multiwavelength spectrum, especially in the middle infrared region, and/or with a detector and/or with an evaluation unit.

39. (Currently Amended) Toilet, including a toilet bowl, ~~containing~~ comprising: at least one ATR body with at least two plane, especially essentially parallel boundary surfaces, which is transparent to middle infrared radiation (MIR), and which has a refractive index, which is higher than that of a medium to be investigated, which is adjacent to at least one boundary surface, especially ~~higher than or equal to 1.5~~, into which a light beam, having a continuous spectrum or a multiwavelength spectrum, ~~especially in the middle infrared region~~, can be coupled; and/or at least a one drainpipe, into which a measuring unit, especially a measuring cell, containing at least one ATR body with at least two plane, especially essentially parallel boundary surfaces, which is transparent or partially transparent to the measuring radiation and has a refractive index which is higher than that of a medium to be investigated, which is adjacent to at least one boundary surface, ~~especially higher than or equal to 1.5~~, is placed, into which a light beam, having a continuous spectrum or a multiwavelength spectrum, ~~especially in the middle infrared region~~, can be coupled.

40. (Currently Amended) Toilet according to Claim 39, especially including an infrared measuring device ~~according to one of Claims 1 to 24, characterized by the fact that~~ having at least one ATR body and at least one infrared light source, wherein the measuring unit contains at least one ATR body, which has at least two plane, essentially parallel boundary surfaces, which are transparent or partially transparent to the measuring radiation and which have a refractive index which is higher than that of the medium to be investigated adjacent to at least one boundary surface, where the IR measuring radiation is middle infrared radiation (MIR) and can undergo attenuated total reflection at least six times on at least one of the plane, parallel boundary surfaces of the ATR body, wherein the ATR body is in working connection with at least one light source, which emits a continuous spectrum or a multiwavelength spectrum, especially in the middle infrared region, and/or with a detector and/or with an evaluation unit.

41. (Currently Amended) Hollow body, ~~especially for use in a needle, a tube or an immersion probe, with nontransparent side walls, especially with a tapering end, characterized by the fact that,~~ comprising:

an ATR body applied tightly in one end region or at one end, especially at the tapered end of the hollow body, or on a surface of the hollow body, an ATR body is applied tightly, which has at least two plane, essentially parallel boundary surfaces, and which is transparent or partially transparent to middle infrared radiation (MIR), and has a refractive index which is higher than that of a medium to be investigated, which is adjacent to at least one boundary surface, especially higher than or equal to 1.5, where at least one laser beam can be coupled to the ATR body through the inside of the hollow body and at least one IR measuring beam can undergo attenuated total reflection at least six times along the measuring section, on at least one of the plane, parallel boundary surfaces of the ATR body.

42. (Currently Amended) ~~Application~~ A method of using the hollow body according to Claim 41, including using the hollow body as a measuring unit or as a component of a measuring unit of an infrared measuring device, especially in a measuring device according to Claims 1 to 24.

43. (Currently Amended) ~~Application~~ A method of using the hollow body, especially of the tube or needle, according to Claim 42, of Claim 41, including using the hollow body for the invasive determination of components in body fluids, especially in the blood of living organisms.

44. (Currently Amended) Cannula, especially a stent, ~~containing~~ comprising: at least one measuring cell, especially a flow-through cell, containing at least one ATR body with at least two plane, essentially parallel, boundary surfaces which is transparent or partially transparent to middle infrared radiation (MIR), and which has a refractive index which is higher than that of the medium being investigated, which is adjacent to at least one of the boundary surfaces, ~~especially which is higher than or equal to 1.5~~, into which at least one beam of a quantum cascade laser can be coupled and at least one IR measuring beam can undergo attenuated total reflection at least six times along the measuring section, on at least one of the plane, parallel boundary surfaces of the ATR body; and/or at least one hollow body ~~according to Claim 42~~.

45. (Currently Amended) Cannula according to Claim 44, ~~especially comprising~~ an infrared measuring device ~~according to one of Claims 1 to 25, characterized by the fact that having~~ at least one ATR body and at least one infrared light source, wherein the measuring unit contains at least one ATR body, which has at least two plane, essentially parallel boundary surfaces, which are transparent or partially transparent to the measuring radiation and which have a refractive index which is higher than that of the medium to be investigated adjacent to at least one boundary surface, where the IR measuring radiation is middle infrared radiation (MIR) and can undergo attenuated total reflection at least six times on at least one of the plane, parallel boundary surfaces of the ATR body, wherein the ATR body is in working connection with at least one quantum cascade laser and/or a detector and/or an evaluation unit.

46. (Currently Amended) ~~Application~~ A method of using the cannula ~~according to of Claim 44 or 45 for the determination, especially essentially simultaneous,~~ quantitative and/or qualitative determination, ~~especially of two, three, four, five, six or more components, especially of saccharides, urea, creatinine and/or triglycerides, in multicomponent mixtures, especially in the body fluids of living organisms.~~

47. (Currently Amended) Measuring unit, especially measuring cell, comprising at least one ATR body, ~~characterized by the fact that the measuring unit contains at least one ATR body (2), which comprises~~ includes at least two plane, essentially parallel boundary surfaces (5a, 5b), which is transparent or partially transparent to middle infrared radiation (MIR), and which has a refractive index which is higher than that of the medium to be investigated, which is adjacent to at least one boundary surface, ~~especially higher than or equal to 1.5~~, where the measuring unit is pressure-resistant, especially to pressures up to 100 bar, and where at least one IR measuring beam can undergo attenuated total reflection at least six times along a measuring section on at least one of the plane, parallel boundary surfaces (5a) of the ATR body (2).



48. (Currently Amended) Automatic analyzer, comprising at least an infrared measuring device according to one of Claims 1 to 24 having at least one measuring unit having at least one ATR body and at least one infrared light source, wherein the measuring unit contains at least one ATR body, which has at least two plane, essentially parallel boundary surfaces, which are transparent or partially transparent to the measuring radiation and which have a refractive index which is higher than that of the medium to be investigated adjacent to at least one boundary surface, where the IR measuring radiation is middle infrared radiation (MIR) and can undergo attenuated total reflection at least six times on at least one of the plane, parallel boundary surfaces of the ATR body, a hollow body according to Claim 41 having an ATR body applied tightly in one end region or at one end, especially at the tapered end of the hollow body, or on a surface of the hollow body, which has at least two plane, essentially parallel boundary surfaces, and which is transparent or partially transparent to middle infrared radiation (MIR), and has a refractive index which is higher than that of a medium to be investigated, which is adjacent to at least one boundary surface, where at least one laser beam can be coupled to the ATR body through the inside of the hollow body and at least one IR measuring beam can undergo attenuated total reflection at least six times along the measuring section, on at least one of the plane, parallel boundary surfaces of the ATR body, and/or a measuring unit according to Claim 47 having one ATR body which comprises at least two plane, essentially parallel boundary surfaces which is transparent or partially transparent to middle infrared radiation (MIR), and which has a refractive index which is higher than that of the medium to be investigated, which is adjacent to at least one boundary surface, where the measuring unit is pressure-resistant, especially to pressures up to 100 bar, and where at least one IR measuring beam can undergo attenuated total reflection at least six times along a measuring section on at least one of the plane, parallel boundary surfaces of the ATR body, and at least one rinsing device for the measuring unit and/or the ATR body and/or at least one drying device for the measuring unit and/or the ATR body.

49. (Currently Amended) ATR body, having one ATR body which comprises at least two plane, essentially parallel boundary surfaces which is transparent or partially transparent to middle infrared radiation (MIR), and which has a refractive index which is higher than that of the medium to be investigated, which is adjacent to at least one boundary surface, where the measuring unit is pressure-resistant, especially to pressures up to 100 bar, and where at least one IR measuring beam can undergo attenuated total reflection at least six times along a measuring section on at least one of the plane, parallel boundary surfaces of the ATR body.

50. (Currently Amended) Method, especially for essentially simultaneous, qualitative and/or quantitative determination of components in aqueous multicomponent systems, using one of:

an infrared measuring device according to one of Claims 1 to 24 having at least one measuring unit having at least one ATR body and at least one infrared light source, wherein the measuring unit contains at least one ATR body, which has at least two plane, essentially parallel boundary surfaces, which are transparent or partially transparent to the measuring radiation and which have a refractive index which is higher than that of the medium to be investigated adjacent to at least one boundary surface, where the IR measuring radiation is middle infrared radiation (MIR) and can undergo attenuated total reflection at least six times on at least one of the plane, parallel boundary surfaces of the ATR body,

a measuring device according to Claim 47 having one ATR body which comprises at least two plane, essentially parallel boundary surfaces which is transparent or partially transparent to middle infrared radiation (MIR), and which has a refractive index which is higher than that of the medium to be investigated, which is adjacent to at least one boundary surface, where the measuring unit is pressure-resistant, especially to pressures up to 100 bar, and where at least one IR measuring beam can undergo attenuated total reflection at least six times along a measuring section on at least one of the plane, parallel boundary surfaces of the ATR body,

an automatic analyzer according to Claim 48 having at least one measuring unit having at least one ATR body and at least one infrared light source, wherein the measuring unit contains at least one ATR body, which has at least two plane, essentially parallel boundary surfaces, which are transparent or partially transparent to the measuring radiation and which have a refractive index which is higher than that of the medium to be investigated adjacent to at least one boundary surface, where the IR measuring radiation is middle infrared radiation (MIR) and can undergo attenuated total reflection at least six times on at least one of the plane, parallel boundary surfaces of the ATR body, a hollow body having an ATR body applied tightly in one end region or at one end, especially at the tapered end of the hollow body, or on a surface of the hollow body, which has at least two plane, essentially parallel boundary surfaces, and which is transparent or partially transparent to middle infrared radiation (MIR), and has a refractive index which is higher than that of a medium to be investigated, which is adjacent to at least one boundary surface, where at least one laser beam can be coupled to the ATR body through the inside of the hollow body and at least one IR measuring beam can undergo attenuated total reflection at least six times along the measuring section, on at least one of the plane, parallel boundary surfaces of the ATR body, and/or a measuring unit having one ATR body which comprises at least two plane, essentially parallel boundary surfaces which is transparent or partially transparent to middle infrared radiation (MIR), and which has a refractive index which is higher than that of the medium to be investigated, which is adjacent to at least one boundary surface, where the measuring unit is pressure-resistant, especially to pressures up to 100 bar, and where at least one IR measuring beam can undergo attenuated total reflection at least six times along a measuring section on at least one of the plane, parallel boundary surfaces of the ATR body, and at least one rinsing device for the measuring unit and/or the ATR body and/or at least one drying device for the measuring unit and/or the ATR body, or

an ATR body according to Claim 49 having one ATR body which comprises at least two plane, essentially parallel boundary surfaces which is transparent or partially transparent to middle infrared radiation (MIR), and which has a refractive index which is higher than that of the medium to be investigated, which is adjacent to at least one boundary surface, where the measuring unit is

pressure-resistant, especially to pressures up to 100 bar, and where at least one IR measuring beam can undergo attenuated total reflection at least six times along a measuring section on at least one of the plane, parallel boundary surfaces of the ATR body,

where including subjecting the middle infrared beam(s) is(are) subjected to attenuated total reflection at least six times, especially seven times, on a measuring section at least of one plane boundary surface of the ATR body, which is immediately adjacent or is adjacent through a coating to the medium of the multicomponent system to be investigated.

51. (New) The infrared measuring device of claim 1, wherein the refractive index is higher than or equal to 1.5:

52. (New) The infrared measuring device according to Claim 21 wherein the coating has a thickness which is in the range from about 2  $\mu\text{m}$  to about 10  $\mu\text{m}$ .

53. (New) The urinal of claim 33, wherein the refractive index is higher than or equal to 1.5.

54. (New) The urinal of claim 33, wherein the laser beam is a beam of a quantum cascade laser.

55. (New) The toilet of claim 35, wherein the refractive index is higher than or equal to 1.5.

56. (New) The toilet of claim 35, wherein the laser beam is a beam of a quantum cascade laser.

57. (New) The urinal of claim 37, wherein the continuous or multiwavelength spectrum is in the middle infrared region.

58. (New) The toilet of claim 39, wherein the continuous or multiwavelength spectrum is in the middle infrared region.

59. (New) The hollow body of claim 41, wherein the refractive index is higher than or equal to 1.5.

60. (New) The cannula of claim 44, wherein the refractive index is higher than or equal to 1.5.